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THE EFFECT OF GIVING FOOT MASSAGE THERAPY ON ANXIETY LEVELS IN CHRONIC KIDNEY FAILURE PATIENTS

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Abstrak

Background: Hemodialysis (HD) is a common therapy for chronic kidney disease (CKD) patients but requires long and repetitive sessions, often leading to physiological and psychological problems, including anxiety. Foot massage therapy is a non-pharmacological intervention that may help reduce anxiety.**Objective:** This study aimed to determine the effect of foot massage therapy on anxiety levels among CKD patients undergoing HD at Pertamina Hospital Palembang. **Method:** A pre-experimental study with a one-group pre-test–post-test design was conducted involving 20 HD patients selected through total sampling. Anxiety levels were assessed using a standardized questionnaire before and after the intervention. Foot massage was applied once after HD for 15 minutes per foot using gentle, rhythmic strokes and circular motions. Data were analyzed using univariate and bivariate approaches, with the paired sample t-test employed to evaluate differences. **Results:** Prior to foot massage, 10 patients (50%) experienced mild anxiety. After the intervention, 8 patients (40%) reported no anxiety. The paired sample t-test showed a significant reduction in anxiety levels ($p = 0.000$). **Conclusion:** Foot massage therapy effectively reduced anxiety levels in CKD patients undergoing HD. This non-pharmacological approach is recommended as a complementary intervention in HD care to help manage anxiety.

Keywords: Anxiety, Chronic Kidney Failure, Foot Massage

Introduction

Chronic kidney disease (CKD) is a major global health issue marked by rising prevalence and incidence rates, leading to poor health outcomes and substantial treatment costs (Saputri, 2023). CKD, also known as chronic kidney failure, is characterized by a gradual and progressive decline in kidney function over time. In this condition, the body loses its ability to regulate fluid and electrolyte balance, resulting in impaired reabsorption processes (Ministry of Health, 2023). According to the World Health Organization (WHO),

kidney disease accounts for approximately 65% of all diabetes-related cases and is also strongly linked to cancer. It is estimated that between 5 and 10 million people die prematurely each year due to kidney-related conditions (WHO, 2023).

According to the 2021 Basic Health Research (Riskesdas), the prevalence of chronic kidney disease (CKD) diagnosed by a doctor among individuals aged over 15 in Indonesia is 0.38%, which corresponds to approximately 713,783 cases out of the total population. In South Sumatra Province, the prevalence of CKD is recorded at 0.27% or around 22,013 cases. Meanwhile, the proportion of CKD patients actively undergoing hemodialysis in this region is estimated at 17.79% (Indonesian Ministry of Health, 2021).

A study conducted by (Pratiwi, 2023) in a Pakistani hospital showed that complications from patients undergoing HD were 80% fatigue, 60% neuro-psychiatric including anxiety and lack of sleep around 55% of 219 patients. Patients undergoing HD tend to experience fatigue or exhaustion which has an impact on nutritional problems, physiological changes (abnormal urea and hemoglobin levels), problems during dialysis (low sodium content of dialysis solution and rapid ultrafiltration) and psychological problems such as depression, anxiety and sleep disorders (Pratiwi, 2023). Long-term dialysis treatment often causes loss of independence, dependence on partners or family, disrupted social life, and decreased financial income. Physical, psychological, socio-economic, and environmental aspects are affected. This also causes changes in quality of life which have an impact on the level of anxiety of kidney failure patients with hemodialysis therapy (Soniawati, 2023).

Anxiety is a condition where there is a threat of lack of control or helplessness, regarding feelings of loss of self-esteem and function, failure in defense, having a sense of isolation (Puspitasari, 2019). Anxiety is a reaction that can be experienced by anyone due to the stressors they face. Chronic kidney failure patients undergoing hemodialysis will also experience high levels of anxiety characterized by feelings of anger, sadness, trembling, nervous weakness, frequent repetition of questions, and increased vital signs (Suwanto et al, 2020).

Hemodialysis complications can cause feelings of discomfort, increase stress and affect the patient's quality of life. The patient's ability to deal with stress cannot be separated from the active role of a nurse. Nurses are required to provide comfort and minimize psychological impacts that can worsen the patient's condition (Saputri, 2023).

There are two ways to manage anxiety, namely pharmacological and non-pharmacological. For non-pharmacological approaches, several therapies can be selected, including music therapy, distraction techniques, and foot massage therapy. Foot massage therapy is chosen because it can effectively reduce anxiety. This therapy helps provide a sense of comfort, lowers anxiety levels, and promotes relaxation. The massage stimulates the parasympathetic nervous system—the branch of the autonomic system responsible for relaxation responses—thereby reducing mental stress and enhancing emotional regulation (Amaludin, 2020). Prior studies have supported the efficacy of foot massage in reducing anxiety. For example, research by Oktaviani et al. (2019) demonstrated a significant decrease in anxiety levels among preoperative patients after receiving foot massage therapy. Similarly, a study by Putri and Setiawan (2021) on cancer patients undergoing chemotherapy showed that foot massage helped alleviate anxiety symptoms and improved psychological comfort. These findings reinforce the potential of foot massage therapy as a supportive, non-invasive intervention to address anxiety, particularly in patients with chronic conditions such as chronic kidney disease.

The importance of this study is because foot massage therapy is an alternative therapy that can provide a sense of comfort and has the potential to reduce anxiety. In the mental aspect, massage causes a relaxed state, reduces mental stress, and increases the capacity to think clearly. In the emotional aspect, a theory suggests that massage stimulates the

parasympathetic nervous system and the branch of the autonomic system that regulates relaxation actions.

Based on the results of a preliminary study, on February 16, 2024 in the hemodialysis room of Pertamina Hospital Palembang, data was obtained on the frequency of patients undergoing hemodialysis twice a week and there were also patients once a week who reasoned that they felt bored and also no one could accompany them during the routine schedule of twice a week for hemodialysis. The prevalence of hemodialysis patients in 2021 was 28 patients who visited the hemodialysis room of Pertamina Hospital Palembang and in 2022 there were 40 patients while in 2023 there were 32 patients who routinely came for hemodialysis therapy 2 times a week each on Monday and Thursday and also on Tuesday, Wednesday and Friday in the hemodialysis unit. Divided into 2 sessions, namely the morning session (08:00 to 12:00 WIB) and the afternoon session (13:00 to 16:00 WIB). CKD patients undergoing HD are between the ages of 25 and 75 years (Medical Record of Pertamina Hospital, Palembang, 2023). According to the hemodialysis supervisor of Pertamina Hospital, Palembang, the duration of hemodialysis therapy for patients is 4-5 hours. The hemodialysis room of Pertamina Hospital, Palembang has 10 hemodialysis machines and 2 hemodialysis machines for patients with suspected infection or patients with positive HBsAg.

For the occurrence of unstable vital signs, especially if high blood pressure occurs, it will increase the activity of the heart and damage the blood vessels in the kidneys. Damage to blood vessels in the kidneys causes filtration problems and further increases the severity of hypertension, this can cause anxiety. And the impact of this incident is that the patient will experience a delay in hemodialysis.

Given the background and issues outlined above, the researcher is motivated to conduct a study entitled "The Effect of Foot Massage Therapy on Anxiety Levels in Patients with Chronic Kidney Failure in the Hemodialysis Unit at Pertamina Hospital Palembang in 2024".

Method

This study employed a one-group pre-test and post-test design, in which no control group was included. The intervention was applied to a single group, and its effectiveness was measured by comparing participants' scores before and after the treatment. The research was conducted at Pertamina Hospital Palembang from March 6 to March 30, 2024. The study population consisted of all patients undergoing hemodialysis at the hospital. According to medical records from the hemodialysis unit, the total population comprised 20 patients. A total (saturated) sampling technique was used, meaning all patients who met the inclusion criteria during the data collection period (March to June 2024) were included as study participants.

The inclusion criteria were: patients who were fully conscious, able to communicate effectively, diagnosed with chronic kidney failure, undergoing hemodialysis for ≤ 3 months, not experiencing leg swelling or pitting edema, and receiving diuretic therapy (furosemide) within the past 48 hours. The exclusion criteria included patients with suspected fractures, those suffering from foot ulcers, individuals with sensory neuropathy (nerve disorders), and uncooperative participants.

Data were collected using the Hamilton Anxiety Rating Scale (HARS), a validated and reliable tool consisting of 14 items designed to assess anxiety levels. Each item is rated from 0 (not present) to 4 (very severe), yielding a total score ranging from 0 to 56. Anxiety levels are categorized as follows: 0–17 (mild), 18–24 (moderate), and ≥25 (severe). The HARS instrument has demonstrated strong validity (>0.70) and reliability (Cronbach's Alpha = 0.85) in previous studies.

The intervention consisted of foot massage therapy administered after hemodialysis sessions to prevent disruption of medical procedures. Each participant received the therapy once a week for two consecutive weeks. Each session lasted 30 minutes, with 15 minutes allocated per foot. The massage techniques used included effleurage (stroking), petrissage (kneading), and circular movements targeting the soles, heels, and toes. The massages were performed by trained nurses who had undergone in-house training supervised by a certified clinical instructor. The intervention took place in a calm and comfortable setting to promote relaxation and minimize external stress.

Following data collection, normality testing was conducted to determine the appropriate statistical analysis method. If data were normally distributed, a Paired Sample t-Test was employed; otherwise, the Wilcoxon Signed Rank Test was used. All analyses were conducted using computerized statistical software to assess the effect of foot massage therapy on anxiety levels in chronic kidney failure patients undergoing hemodialysis at Pertamina Hospital Palembang in 2024.

Results

In this study, respondent characteristics were analyzed based on gender, age, educational background, and duration of hemodialysis treatment. The detailed distribution of these characteristics is presented in the table below:

Table 1. Characteristics of Respondents at Pertamina Hospital Palembang in 2024 (n=20)

Characteristics	Frequency (f)	Percentage (%)
Gender		
1. Male	7	35
2. Female	13	65
Total	20	100
Age		
1. 50-65 years	18	90
2. < 50 or > 65 years	2	10
Total	20	100
Education		
1. Not going to school	1	5
2. Elementary school	2	10
3. Middle school	4	20
4. High school	12	60
5. College	1	5
Total	20	100
Hemodialysis Duration		
1. 1 month	5	25
2. 2 months	15	75
Total	20	100

Based on Table 1 above, out of the 20 respondents, the majority were female, totaling 13 individuals (65%). Most participants were between the ages of 50 and 65 years (18 respondents or 90%), 12 respondents (60%) had attained a high school level of education, and 15 respondents (75%) had been undergoing hemodialysis for a duration of two months.

The patients' anxiety levels prior to receiving foot massage therapy were categorized into five groups: no anxiety, mild anxiety, moderate anxiety, severe anxiety, and very severe anxiety. The results of the univariate analysis are presented in the table below:

Table 2 Frequency Distribution of Patient Anxiety Levels Pre-Post Test Foot Massage Therapy at Pertamina Hospital Palembang in 2024

Anxiety Level	Before Intervention	After Intervention
	F (%)	F (%)
Not Anxious	0 (0)	8 (40)
Mild Anxiety	10 (50)	11 (55)
Moderate Anxiety	8 (40)	1 (5)
Severe Anxiety	2 (10)	0 (10)
Very Severe Anxiety	0 (0)	0 (0)
	20 (100)	20 (100)

Based on Table 2, the findings show that out of 20 respondents, 10 individuals (50%) experienced mild anxiety, 8 respondents (40%) had moderate anxiety, and 2 respondents (10%) had severe anxiety prior to receiving foot massage therapy. Following the intervention, patients' anxiety levels were again categorized into five groups: no anxiety, mild anxiety, moderate anxiety, severe anxiety, and very severe anxiety. As shown in Table 3, 8 respondents (40%) reported no anxiety, 11 respondents (55%) had mild anxiety, and only 1 respondent (5%) experienced moderate anxiety.

Before conducting bivariate analysis, a normality test was performed to determine the appropriate statistical method. The normality test is used to assess whether the data follow a normal distribution, which is essential for the use of parametric statistical tests. Data are considered normally distributed if the p-value is greater than the significance level (α). If the data meet this criterion, the Paired Sample t-Test is used; otherwise, the Wilcoxon Signed Rank Test is applied.

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Table 3. Data Normality Test Results

No	Variables	Normality test results
1	Pretest	,099
2	Posttest	,063

The results of the normality test obtained all p values in the pretest and posttest groups t> α = 0.05, so it can be concluded that the data is normally distributed, then the bivariate analysis uses the paired sample t test. The results of the paired sample t test in this study are as follows:

Table 4. The Effect of Foot Massage Therapy on Patient Anxiety Levels at Pertamina Hospital Palembang in 2024

Anxiety	Mean	Mean Different	Std Deviasi	*p value* Sig. (2-tailed)
Pre Test	21,20	5,200	3,901	0,000
Post Test	16,00		3,449	

Based on Table 5, the findings indicate that the mean anxiety level before receiving foot massage therapy was 21.20 with a standard deviation of 3.901. After the therapy, the mean anxiety level decreased to 16.00 with a standard deviation of 3.449. This shows a reduction of 5.200 in the average anxiety score. The results of the statistical analysis revealed a p-value of 0.000 (<0.05), indicating that the alternative hypothesis (Ha) is accepted. Therefore, it can be concluded that foot massage therapy has a significant effect

on reducing anxiety levels in chronic kidney failure patients in the Hemodialysis Room at Pertamina Hospital Palembang in 2024.

Discussion

Patient Anxiety Level Before Foot Massage Therapy

The results of this study are in line with Soniawati's theory (2023), long-term dialysis treatment often causes loss of independence, dependence on partners or family, disrupted social life, and decreased financial income. Physical, psychological, socio-economic, and environmental aspects are affected. This also causes changes in the quality of life which have an impact on the level of anxiety of kidney failure patients with hemodialysis therapy. According to Sherwood (2016), anxiety is characterized by disturbing feelings, restlessness and fear. In addition, the effects of anxiety also increase the secretion of cortisol into the blood. Increased cortisol secretion during anxiety has an effect on the body, namely increased metabolism, increased blood pressure and an increase in blood fatty acids due to the lipolysis process to provide raw materials for gluconeogenesis and degradation or disassembly of proteins to provide amino acids that will be deployed in various oxidative pathways as a stress response.

The emergence of anxiety in patients undergoing hemodialysis therapy can occur due to errors in responding to their health conditions. Poor health conditions in these patients become a stressor for them which are then responded to in a partly adaptive and partly maladaptive manner. If this maladaptive response is not handled properly, it can cause psychosocial problems such as anxiety. According to Harjhana in Widyastuti (2020), factors that influence anxiety are illness and conflict, family and the individual's environment. As cited by Rini (2022), Shah explains that severe anxiety is marked by a considerable narrowing of the perceptual field. Individuals experiencing this level of anxiety tend to concentrate only on specific details and struggle to consider other aspects. Their actions are primarily directed at alleviating the anxiety, often requiring substantial guidance to redirect their attention. This aligns with the findings of Amaludin (2020), who studied the impact of foot massage therapy on anxiety levels in chronic kidney failure patients undergoing hemodialysis at Ulin Banjarmasin Hospital.

Patient Anxiety Level After Foot Massage Therapy

The results of the study showed that out of 20 respondents, 8 respondents (40%) did not experience anxiety, 11 respondents (55%) had mild anxiety, and 1 respondent (5%) had moderate anxiety. The results of this study are in line with Soniawati's theory (2023) that foot massage therapy is a non-pharmacological therapy and can be an alternative to provide comfort and reduce anxiety. This therapy is believed to help reduce anxiety levels and to achieve or improve health. From a mental perspective, massage will relax the body, reduce stress, and increase the ability to think clearly. Emotionally, massage has been shown to stimulate the parasympathetic nervous system and part of the autonomic system to regulate relaxation functions.

According to Amaludin (2020), the pathophysiological mechanism of foot massage is not only responded to by the sensory organs of touch (skin), but also involves several other sensory organs such as hearing and sight. An explanation of the procedure and benefits of the massage performed can unite perceptions and expectations during the massage process compared to massage performed without any explanation. This is very likely to help respondents increase their sense of self-esteem and affect the processing of stimuli received by the brain. During the massage process, respondents can also observe every rhythm of the massage, even a rhythm that is regular and predictable by the client is believed to have a

sedative effect. Scheduling a massage time before the hemodialysis procedure also helps respondents manage pain or anxiety caused by the procedure. According to Saputri (2023), in the mental aspect, massage causes a relaxed state, reduces mental stress, and increases the capacity to think clearly. In the emotional aspect, a theory suggests that massage stimulates the parasympathetic nervous system and the branch of the autonomic system that regulates relaxation actions. Physiologically, the touch of the massage will first be processed by the receptor cells in the skin and then continued by sending neurochemical signals to large areas of the somatosensory cortex that remind each touch contact with the outside world. This stage is largely determined by contextual factors involving the prefrontal cortex (PFC). The contextual form in question is the existence of an explanation of the stimulus received, whether it is considered a pleasant stimulus or a painful stimulus. The signal that is considered pleasant will activate the lateral orbitofrontal cortex (OFC) and the pregenualan anterior cingulated cortex (pgACC). Activation of these systems allows a person to enjoy certain stimuli, provide motivation, and thus control some behaviors and body responses such as the activation of the serotonin hormone, including the improvement of the anti-anxiety capacity of the GABA receptor.

The findings of this study are consistent with the research conducted by Amaludin (2020), which examined the effect of foot massage therapy on anxiety levels in patients with chronic kidney failure undergoing hemodialysis at Ulin Banjarmasin Hospital. The univariate analysis in that study showed a post-intervention anxiety score of 18.15 following foot massage therapy.

Similarly, this study aligns with the research by Pamungkas and Yuniartika (2022) on the effect of foot massage on fatigue in chronic kidney failure patients undergoing hemodialysis. Their results indicated a significant improvement in VASEF (Visual Analogue Scale for Fatigue) scores. Prior to the intervention, participants were categorized as experiencing severe fatigue. However, after receiving foot massage therapy twice a week for 20 minutes, their fatigue levels decreased to the mild category.

Similarly, the findings of this study are supported by Soniawati's research (2023) on the application of foot massage therapy in patients with chronic kidney failure undergoing hemodialysis. This case study was conducted on a patient, Mr. W, who met the inclusion criteria. The foot massage intervention was administered over three consecutive days, and anxiety levels were measured before and after the intervention. The results demonstrated that foot massage therapy was effective in reducing the patient's anxiety scale.

Based on the current findings, theoretical perspectives, and supporting studies, the researcher assumes that foot massage therapy can help alleviate anxiety in patients with chronic kidney failure. This is likely due to the stimulation of the parasympathetic nervous system a component of the autonomic nervous system which promotes relaxation, reduces stress, and enhances cognitive functioning by inducing a calmer physiological state.

The Effect of Foot Massage Therapy on Patient Anxiety Levels at Pertamina Hospital, Palembang

The results of this study demonstrated that the mean anxiety level before the administration of foot massage therapy was 21.20 (SD = 3.901), while the mean anxiety level after the therapy decreased to 16.00 (SD = 3.449). This reflects a reduction of 5.200 points in the average anxiety score. The statistical analysis yielded a p-value of 0.000 (< 0.05), indicating that the alternative hypothesis (Ha) is accepted. Therefore, it can be concluded that foot massage therapy significantly reduces anxiety levels in patients with chronic kidney failure undergoing hemodialysis at Pertamina Hospital, Palembang in 2024.

These findings are consistent with Berman’s theory as cited in Rudiyanto (2022), which states that foot massage therapy is effective in reducing anxiety. The therapy induces comfort,

promotes relaxation, alleviates mental stress, and enhances cognitive clarity. From an emotional perspective, massage activates the parasympathetic nervous system part of the autonomic nervous system responsible for relaxation responses. This is also supported by Soniawati (2023), who emphasized that foot massage relieves fatigue and induces a sense of well-being. The physiological effects of foot massage include the stimulation of serotonin and dopamine secretion, which in turn promotes the release of endorphins contributing to feelings of pleasure and relaxation. Additionally, it reduces cortisol levels in the blood, helping to stabilize emotions, relieve mental tension, and lower anxiety. Importantly, the effectiveness of this therapy in patients with chronic kidney failure also depends on the appropriate adjustment of massage pressure to avoid discomfort.

Moreover, this study aligns with Nasution's (2022) research on the impact of foot massage therapy on blood pressure and psychological anxiety in the families of chronic kidney failure patients. The results showed a p-value of 0.000 ($\alpha = 0.05$), confirming that foot massage has a significant psychological effect in this context. The findings also reinforce the results of Amaludin's (2020) study conducted at Ulin Banjarmasin Hospital, which revealed that the mean anxiety score dropped from 20.70 to 18.15 after foot massage therapy. The bivariate analysis similarly showed a significant effect with a p-value of 0.000, supporting the use of foot massage therapy in managing anxiety among patients with chronic kidney failure undergoing hemodialysis.

Based on the collective findings and theoretical frameworks, the researcher concludes that foot massage therapy has a notable effect in reducing patient anxiety levels. In this study, the therapeutic process involved not only tactile stimulation through the skin but also engagement of other senses such as hearing and sight. The explanation provided by the researcher regarding the procedure and its expected benefits likely helped unify patient perceptions and set positive expectations, potentially enhancing the therapeutic effect compared to massages performed without any prior explanation.

Conclusions

The findings of this study indicate that foot massage therapy significantly reduces anxiety levels in patients with chronic kidney failure undergoing hemodialysis. This non-pharmacological intervention can be considered as a supportive therapy to improve psychological well-being. Foot massage helps create a sense of relaxation, reduces mental stress, and promotes emotional comfort. It is recommended that this therapy be implemented as a routine complementary intervention in hemodialysis care, and that families be involved to continue the therapy at home under proper guidance.

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